BOROUGH OF MANHATTAN COMMUNITY COLLEGE
City University of New York

Department of Science

Title of Course Computer Aided Analysis for Engineering
ESC 113 Section _____
Spring 2018
Credits 2

Class hours 1
Lab hours 3
Instructor Information
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Room: N699D

Course Description
This course introduces topics important for engineers computer aided analysis techniques are introduced and used for the design, and modeling of engineering systems such as electrical circuits, pipelines, signal and image processing, aircraft engines, orbits and trajectories, protein molecules, and sewer treatment.

Prerequisites/Co-requisites
Prerequisite: MAT 206
Corequisite: CHE 210 or PHY 215 or permission of the department

Required Text & Readings
Author: Etter, D.
Title: Engineering Problem Solving with Matlab®
Ediiton: 2nd
Publisher: Prentice Hall (1997)

Evaluation & Requirements of Students
Midterm Examination   35%
Final Examination   45%
Projects   20%

Course Student Learning Outcomes (Students will be able to…)	Measurements (means of assessment for student learning outcomes listed in first column)
1. Identify and apply the fundamental concepts and methods of engineering mathematics.	1. Graded problems involving calculations based on a lab exercise: exam questions.
2. Demonstrate the proficiency of using a computer to solve engineering mathematical problems	2. Laboratory projects will require the use of the MATLAB software suite to calculate all necessary numerical results.
3. Calculate, analyze, and interpret data and present it in an effective written laboratory report.	4. Graded lab reports, where students will report, analyze and present scientific numerical calculations.

	General Education Learning Outcomes	Measurements (means of assessment for general education goals listed in first column)
	Communication Skills- Students will be able to write, read, listen and speak critically and effectively.	
☑	**Quantitative Reasoning-** Students will be able to use quantitative skills and the concepts and methods of mathematics to solve problems.	1. Graded problems involving calculations: exam questions 2. Project writeups, exam questions 3. Graded lab exercise involving the collection, tabulating and plotting of physical data
	Scientific Reasoning- Students will be able to apply the concepts and methods of the natural sciences.	
	Social and Behavioral Sciences- Students will be able to apply the concepts and methods of the social sciences.	
	Arts & Humanities- Students will be able to develop knowledge and understanding of the arts and literature through critiques of works of art, music, theatre or literature.	
	Information & Technology Literacy- Students will be able to collect, evaluate and interpret information and effectively use information technologies.	
	Values- Students will be able to make informed choices based on an understanding of personal values, human diversity, multicultural awareness and social responsibility.	

Outline of Topics

WEEK	TOPIC
1	MATLAB Fundamental Computations and Functions
2	Scalar Variables
3	Creating Vectors and Matrices
4	Addressing Vectors and Matrices
5	Built-In Functions for Handling Arrays
6	Strings
7	Review and Midterm Exam
8	Mathematical Operations with Arrays
9	Solving Simultaneous Equations
10	Random Numbers
11	Dynamic Input and Formatted Output of Numerical Data
12	Reading/Writing Data to/from Files
13	Two-Dimensional Plots
14	Polynomials
15	Review and Final Examination

College Attendance Policy

At BMCC, the maximum number of absences is limited to one more hour than the number of hours a class meets in one week. For example, you may be enrolled in a three-hour class. In that class, you would be allowed 4 <u>hours</u> of absence (not 4 days). In the case of excessive absences, the instructor has the option to lower the grade or assign an F or WU grade.

Academic Adjustments for Students with Disabilities

Students with disabilities who require reasonable accommodations or academic adjustments for this course must contact the Office of Services for Students with Disabilities. BMCC is committed to providing equal access to all programs and curricula to all students.

BMCC Policy on Plagiarism and Academic Integrity Statement

Plagiarism is the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism.

Students who are unsure how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited work. The full policy can be found on BMCC's web side, www.bmcc.cuny.edu. For further information on integrity and behavior, please consult the college bulletin (also available online).